U.S. Department of Homeland Security
United States Coast Guard

Commanding Officer
USCGC HEALY (WAGB 20)

1519 Alaskan Way S
Seattle, WA 98134
Phone: (206) 217-6300
Fax: (206) 217-6309

16155
11 Apr 06

MEMORANDUM

From: [redacted] CAPT
CGC HEALY (WAGB 20)

To: PACAREA

Subj: ARCTIC WEST SUMMER 2005 CRUISE REPORT

Ref: (a) Polar Icebreaker Cruise Reports, COMDTINST 16155.2B

1. This report is submitted in accordance with reference (a) and covers the period from 1 June to 28 November 2005.

2. HEALY completed three missions to support Arctic research during AWES-05. HLY 05-01 and 05-03, the first and third missions, were NSF funded and focused on coring and collecting geo-physical transect data via a towed seismic gun and streamer. HLY 05-02 was funded by NOAA Ocean Exploration. This mission focused on cataloging the biomass of the Arctic marine species. This phase was characterized by around the clock evolutions as five distinct groups studied marine mammals, species on the ice, under the ice, in the pelagic (mid-water) region, and benthic (bottom) region. Coast Guard divers logged 50 hours underwater in support of this second science mission. A Remote Operated Vehicle (ROV) was also used to explore and capture live specimens from the pelagic and benthic regions.

3. HLY 05-03 included a visit to the geographic North Pole on September 12. This was the second visit for HEALY and the third for a US surface ship. The 12 day transits immediately preceding and following the North Pole were joined by the Swedish Icebreaker ODEN. Together the two ships worked to collect data for joint scientific analysis and to escort each other depending on the ice conditions.

4. During Arctic West-East Summer 05, HEALY provided 106 supported science days, 24 of which were in conjunction with the Swedish Icebreaker ODEN. AWES05 marks the final deployment for the Coast Guard's Polar Operations Division.

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Enclosure: Arctic West Summer 2005 Cruise Report

Dist: :

	Qty
Commandant (G-OPN, G-OCU, G-OCA, G-SEN)	1 ea
Commander, Pacific Area (Po, Pof, Poo)	2 ea
Commander, Atlantic Area (Ao)	1
MLCP (v, t)	1 ea
USCG Academy	1
Aviation Training Center (POPDIV)	1
USCGC POLAR STAR	2
USCGC POLAR SEA	2
Arctic Icebreaker Coordination Committee	10

	Qty
National Science Foundation	1
Center for Polar and Scientific Archives National Archives of the United States	1
U.S. Army Cold Regions Research and Engineering Lab	2
Engineering Logistics Center (01, 02)	1 ea
NESU Seattle	1
ESU Seattle	1

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CHAPTER X - DIVING

1. Summary

A. Pre-Deployment Preparations & Seattle to Barrow

1. During the 2005 inport, the dive locker was restocked with items that had been expended or lost, such as fins, weights, dry suit cuffs and neck seals, and gloves. The compressor was air tested and the gauges calibrated. SCUBA tanks (20) were given Visual Inspections in accordance with tank maintenance procedures. Tank hydrostatic tests are current until 2009. All APEK regulators and EXO masks were given proper PMS. Three sets of EXO comms were procured to replace badly rusted units. Vidmars and a new cabinet were installed to better organize tools and equipment.

2. Three divers transferred from HEALY. One current HEALY member successfully completed dive school during the inport. Due to the number of dives requested by the HLY05-02 science party, one diver who was due to rotate was retained through this mission, and the dive officer from POLAR SEA joined HEALY as a TAD member. This gave the team five members, with two leaving after HLY05-02. The AWES'05 dive team consisted of: LTJG Jessica Noel (Dive Officer), ENS [redacted], ENS Ariel Piedmont (POLAR SEA), MKCS [redacted], and BM2 [redacted].

LCVP Crew and dive team

3. During the transit from Seattle to Barrow, ENS [redacted] and LTJG Noel provided extensive training on the Emergency Evacuation Hyperbaric Stretcher for the divers, medical personnel and aviation detachment. The training covered symptoms of decompression illness and how to treat it in a chamber, the proper use of the chamber, and how to install the chamber in the helicopter for transport. This training was a great refresher for those who had used the chamber before and a significant learning event as none in attendance had actually put one into a helicopter. The set-up and helo installation was practiced twice, once empty and once with a volunteer diver.

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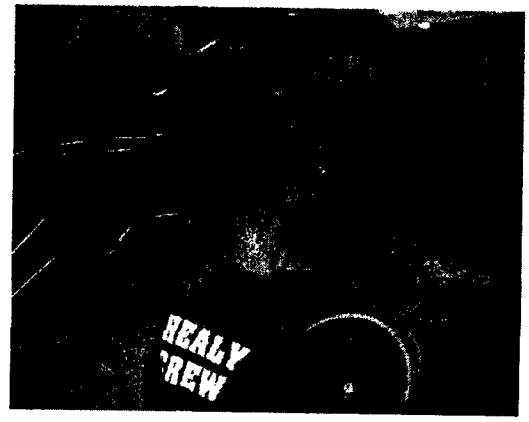
B. AWES 05-01

1. This bottom coring and sub-bottom profiling mission did not require any dive operations. The team spent the time cleaning and organizing the locker in preparation for the next science mission. Each diver ensured they had all of their personal gear ready for diving. As a group, the divers prepared harnesses, buoyancy compensators, tanks, and the surface supplied diving (SSD) equipment for upcoming dive operations.



Emergency Evacuation Training for divers, aviators, and medical personnel

2. The dive team did pre-dive maintenance on the EXO full face masks, including communications checks, to ensure they were ready for diving. The landing craft, HEALY-3, was given a "ship check" to determine layout of dive gear and if any discrepancies needed attention. A plug had to be designed to connect the SSD comms and air console to a 12V power receptacle in the HEALY-3 cabin. At the end of this two-week mission, the dive gear was ready, the SSD equipment and tanks were staged in HEALY-3, and the dive locker was ready to accommodate the science divers for the next phase.

C. AWES 05-02

1. The second mission of AWES'05 was in support of the NOAA Ocean Exploration program. To accomplish the objectives of the under-ice and pelagic biota studies, the science party included three science divers and requested assistance from HEALY's

Science divers conducted video transects of the ice bottom

dive team. The science divers were required to adhere to the CG policy outlined in the CG Diving Policies and Procedures Manual, COMDTINST M3150.1B (Ch 5.E.6). The divers' certifications were provided to the Dive Officer prior to the mission. Also IAW this instruction, the CG divers would not operate in buddy pairs with the science divers and would not supervise their dives.

2. HEALY provided the science divers with six single SCUBA tanks, dive weights, and space in the locker for drying, maintenance and stowage of their gear. The dive team ensured all tanks were charged (filled with compressed air) each day. The science divers were performing SCUBA dives, while the CG divers conducted surface supplied dives. For both teams, divers were tended via tending line, buddy line, and/or umbilical.

Science SCUBA divers on an ice floe

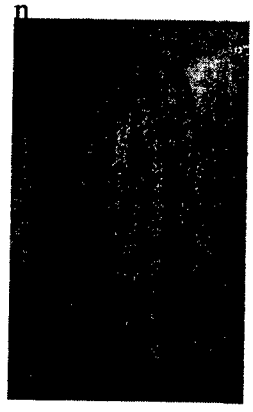
3. The first diving day, both teams did practice dives to get familiar with the type of sampling that needed to be accomplished, including video surveys, ice bottom transects, and organism collections. The science team focused on the ice bottom by taking video and identifying, counting and collecting amphipods. The HEALY divers were put to work collecting ctenophores (comb jellies) from the water column.

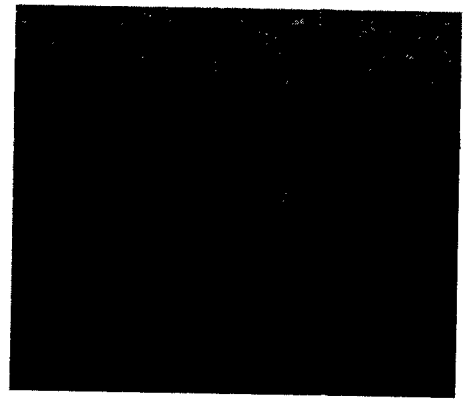
4. The science divers dove almost daily and typically from the ice. They loaded their gear on HEALY's sleds, deployed via the "man basket" and pulled the sleds to the dive site. HEALY provided boxed lunches. Only on two occasions did the science divers deploy on HEALY-3 with the CG team, and even then they would set-up their dive site on the ice. This worked out well because the divers were not in each other's way in the water and the crowding on the boat was kept to a minimum.

CG Diver collecting Comb Jelly Fish

5. HEALY's dive team utilized HEALY-3 as the dive boat due to the large amount of gear associated with SSD. This involved the boat crew consisting

of a coxswain, crewman/bear watch, and engineer, and often included one or two break-ins. One scientist accompanied the team to organize the sampling. One or two additional CG personnel were brought along as dive tenders; when n

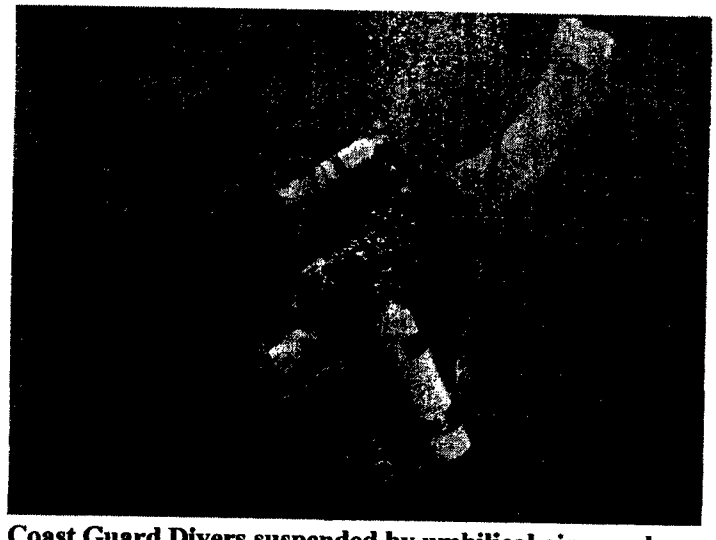




Samples of the two species of Comb Jelly Fish collected

boat engineer would tend. The five dive team members made up the side as dive supervisor, two divers, console operator, and standby diver. The dive side was set up with two SSD rigs with EXO mask and emergency gas supply (EGS) bottles, one extra full set-up, and the standby SCUBA rig (set of double tanks with separate first stage regulators). The bin containing the five sets of double tanks and SSD console was removed after each dive in order charge the tanks and protect the console.

6. The team dove at 12 of 14 stations, with each evolution (from boat deployment to recovery) lasting approximately four hours. Boxed lunches and coffee were a necessity. The dives were primarily limited by diver temperature as most of our collections were at 40-50 feet; table limits were the secondary limiter. Two divers would launch and a mesh bag containing plastic jars was lowered to the approximate depth where the ctenophores were expected. At 30 and 40 feet, they would stop to look for the jellies. When they were located, the divers would take a jar and go to work. Collecting the ctenophores proved to be an often-frustrating task. Some species had long tentacles that they would mostly retract when disturbed, making it relatively



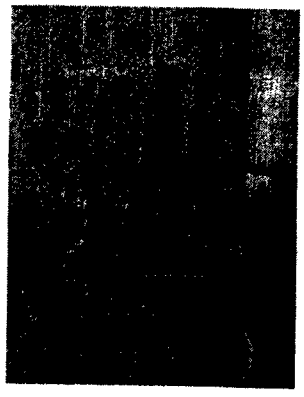
Coast Guard Divers suspended by umbilical air supply and tending line

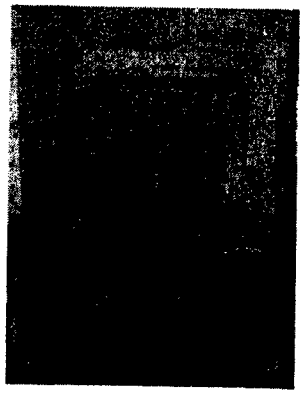
easy to gently scoop them into a jar. Others were very delicate and would get distorted and pushed away by the water movement around the jar. Those were easier to collect with a double-ended jar that had twist-tops on both ends. Both types had to be collected carefully.

7. At each dive site, two to four divers would be deployed depending on the number of ctenophores in the area and the divers' bottom time. Five sets of double tanks provided more than enough air for four divers to have 30-60 minute dives. The standby diver was always a clean diver. It took a few dives for each member to figure out their individual comfort level of thermal layers and glove liners. The biggest recurring problem was leaking gloves, indicating the need for research and attainment of appropriate gloves.

8. The HEALY dive team had one case of mild hypothermia triggered by leaking gloves. The diver was removed from the water and placed in the heated cabin of HEALY-3 in dry clothing, a blanket and Arctic coat. There was also one uncontrolled ascent as a diver moved between depths to collect samples but did not adjust dry suit air. After a few minutes of questioning and examining, the diver returned to depth and work. Given the frigid, ice-covered environment, the dives went smoothly and without major complications. The scientists were happy with their samples and the divers were happy with their dives.

9. During the 12 diving days, each diver obtained four to seven dives with bottom times between 20 and 70 minutes at depths of 30 to 100 feet. Total combined bottom time for all five divers was nearly 22 hours and over 140 samples were collected.





Samples of Comb Jelly Fish collected by divers

10. Dive Log

Date	Station	Diver	TBT (min)	Depth (ft)	Schedule
28-Jun-05	2	[redacted]	:22	30'	30'/:30
		[redacted]	:22	30'	30'/:30
29-Jun-05	3	[redacted]	:58	75'	80'/:60
		[redacted]	:34	55'	60'/:40
3-Jul-05	4	Noel	:56	54'	60'/:60
		[redacted]	:22	32'	35'/:25
		[redacted]	:27	44'	50'/:30
5-Jul-05	5	[redacted]	:15	50'	50'/:15
		[redacted]	:43	50'	50'/:50
		[redacted]	:23	40'	40'/:25
7-Jul-05	6	Noel	:28	50'	50'/:30
		[redacted]	:38	50'	50'/:40
		[redacted]	:60	45'	50'/:60
		[redacted]	:30	60'	60'/:30
9-Jul-05	7	[redacted]	:25	75'	80'/:25
		Noel	:31	80'	80'/:35
11-Jul-05	8	Noel	:26	81'	90'/:30
		[redacted]	:30	88'	90'/:30
14-Jul-05	9	[redacted]	:34	80'	80'/:40
		[redacted]	:34	80'	80'/:40
		[redacted]	:16	100'	100'/:20
16-Jul-05	11	Noel	:38	43'	50'/:40
		[redacted]	:38	61'	70'/:40
		[redacted]	:46	55'	40'/:50
		[redacted]	:46	40'	60'/:50
20-Jul-05	13	[redacted]oel	:44	60'	60'/:50
		[redacted]	:38	80'	70'/:35
		[redacted]	:30	70'	80'/:40
		[redacted]	:37	52'	60'/:40
23-Jul-05	15	[redacted]	:69	55'	60'/:70*
		Noel	:46	42'	50'/:50
		[redacted]	:31	48'	50'/:40
24-Jul-05	15	[redacted]	:60	50'	50'/:70
		[redacted]	:60	56'	60'/:60
		[redacted]	:21	55'	60'/:25

* Diver completed a 7 minute decompression stop at 10 feet.

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D. LTT

1. After the HLY05-02 science party debarked at Barrow, AK, the dive team again cleaned and organized the locker. All of the heavily used gear was rinsed and dried thoroughly before stowing. The locker and equipment was again ready for use.

2. Plans for restructuring and renovating the locker were initiated. These changes include removing the miscellaneous UPS, moving the compressor to an approved location just outside of the locker but in the hanger, and converting the head into a drying room for wet gear. Shelves will also be installed in the locker and drying room and some of the lockers will be removed. Most of this will occur during the next inport but some of the prep work can be done while still underway.

E. Dutch Harbor, AK

NSTR.

F. HLY05-03

1. There were eight members on HEALY (including two TAD) who are very interested in the CG dive program. The Dive Officer talked with them about what it takes to get into and successfully complete dive school and what to expect as a CG diver. The prospective candidates started a dive school prep workout and were given a baseline test to determine areas of improvement for push-ups, sit-ups and pull-ups. The Dive O will continue to conduct these progress tests each month for the duration of the deployment.

2. Upon Dive Officer's request, the EM division investigated the UPS in the locker. They found that it had been installed to support a science van on the port 02 deck but was not correctly configured. There was a matching UPS on the starboard side of the hangar that was also investigated. The concern with it being in the dive locker was that wet gear was frequently hung from the overhead near the UPS. It has been removed.

G. Tromso, Norway

NSTR.

H. Dublin to Seattle

1. Progress tests for candidates.

2. Training for current divers.

2. Recommendations

A. Determine boxed lunch needs prior to deployment to allow the FS division to stock and plan accordingly.

B. Research better dry gloves.

C. Better dry suit familiarization prior to deployments with dive ops.

HEALY's 2005 Dive Team (Left to Right): BM2 [redacted], ENS [redacted], ENS [redacted], LTJG Noel, MKCS [redacted]

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